

## CLAIMS

1. A speaker comprising

a magnet structure defining a flux gap

5 a voice coil residing in the flux gap, and

a main diaphragm connected to the voice coil such that a drive current applied to the voice coil moves the diaphragm to generate sound,

the main diaphragm being connected to the voice coil at a back plane and extending forward of the back plane,

10 wherein the voice coil and magnet structure are centered on the main diaphragm in a location ahead of said back plane, thereby forming a speaker of reduced depth.

2. The speaker of claim 1, wherein said magnet structure extends from a back end to a forward end, and defines an additional flux gap located at the forward end

15 the speaker including an additional diaphragm driven by a coil positioned in the additional flux gap and located centrally ahead of the main diaphragm.

3. The speaker of claim 2, wherein the main diaphragm and additional diaphragm are positioned to maintain a common sound center for enhanced spatial fidelity of sound

20 reproduction.

4. The speaker of claim 1, wherein said diaphragm is mounted in a frame such that a back wave couples through a central opening into space behind the speaker.

25 5. The speaker of claim 1, further comprising an enclosure wherein the speaker is mounted in the enclosure forming a flush-mount system.

6. A magnet structure for a speaker assembly, such magnet structure comprising at least two permanent magnets, a pole assembly including at least one pole-forming element, and a shunt member disposed between said magnets, said shunt being connected between said permanent magnets and angling around to concentrate flux of said permanent magnets between pole faces forming form a front voice coil gap positioned at a front of said magnet structure and a back voice coil gap positioned at a back of said voice coil structure such that said magnet structure drives two diaphragms at its front and back, respectively.

7. A speaker assembly having a speaker cone with a front interior, a voice coil connected to the speaker cone, and a magnet assembly forming a focused magnetic gap for driving the voice coil, wherein the magnet assembly is positioned in the front interior of the cone so that the rear of the cone is unobstructed, whereby a back wave from said cone is more effectively coupled to a ported enclosure.

8. A speaker assembly having a speaker cone with a front interior, a voice coil connected to the speaker cone, and a magnet assembly forming a focused magnetic gap for driving the voice coil, wherein the magnet assembly is positioned in the front interior of the cone forming an assembly of reduced depth.

9. A speaker assembly having a front diaphragm, a rear diaphragm, and a single magnet assembly disposed between said front and said rear diaphragm, wherein said single magnet assembly drives both said front and said rear diaphragms.

10. The speaker assembly of claim 9, wherein said single magnet assembly is an annular assembly.

11. The speaker assembly of claim 9, further comprising a frame supporting said magnet assembly and at least a portion of said rear diaphragm.

12. The speaker assembly of claim 11 mounted in a ported enclosure such that a back wave of at least one diaphragm couples into the enclosure.